

THIS OPINION WAS NOT WRITTEN FOR PUBLICATION

The opinion in support of the decision being entered today (1) was not written for publication in a law journal and (2) is not binding precedent of the Board.

Paper No. 17

UNITED STATES PATENT AND TRADEMARK OFFICE

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BEFORE THE BOARD OF PATENT APPEALS  
AND INTERFERENCES

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Ex parte WERNER KOTZAB

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Appeal No. 98-1984  
Control No. 90/004,441<sup>1</sup>

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ON BRIEF

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Before KIMLIN, WARREN and WALTZ, Administrative Patent Judges.

KIMLIN, Administrative Patent Judge.

DECISION ON APPEAL

This is an appeal from the final rejection of claims 1-10, all the claims in the present reexamination proceeding. Claim 1 is illustrative:

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<sup>1</sup> Request filed November 4, 1996, Control No. 90/004,441, for the reexamination of U.S. Patent No. 5,427,720, issued June 27, 1995, based on Application No. 08/201,976, filed February 25, 1994.

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1. An improved method of controlling the temperature of an injection mold by pressure feeding molding material into a mold recess of an injection mold by an extruder, curing the material in the mold, and removing molded material from the mold, said pressure feeding, curing, and removing being a molding cycle of recurring molding cycles and said recurring molding cycles having at least a first molding cycle and a second molding cycle,

comparing a preset nominal temperature to an actual temperature measured by at least one temperature sensor during said first molding cycle and said second molding cycle and supplying an amount of a temperature controlling medium to the first molding cycle and the second molding cycle, said amount of temperature controlling medium being dependent on the deviation between the actual temperature measured and the desired preset nominal temperature, the improvement comprising:

controlling, via a single sensor, a plurality of flow control valves for the temperature controlling medium to provide impulse temperature control medium to the first and second molding cycles,

determining empirically or by calculation a quantitative spacial distribution of temperature controlling medium needed to obtain said desired preset nominal temperature during at least the first molding cycle and the second molding cycle and determining empirically or by calculation the conduits needed to be utilized to obtain the desired preset nominal temperature during at least the first molding cycle and the second molding cycle,

comparing said desired preset nominal temperature to said actual temperature at least once during the first molding cycle and the second molding cycle at a certain point in time being the same for each said molding cycle, such that said comparison made during said first cycle is synchronized with said comparison made during said second subsequent molding cycle, and said plurality of flow control valves are triggered during each said cycle to provide said impulse control medium, and said triggering being dependent on the deviation of

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temperature determined for each said comparison and also being dependent on a stored profile of said quantitative spacial distribution of the temperature controlling medium.

The examiner relies upon the following references as evidence of obviousness:

Hall	5,046,370	Sep. 10, 1991
Evans (PCT Application)	WO 92/08598	May 29, 1992

Horst Wieder, "Understanding the Pulse Modulated Mold Temperature Control Method," 1-6 (CITO Products Inc. 1987)

Appellant's claimed invention is directed to a method of controlling the temperature of an injection mold by employing a single sensor for controlling a plurality of flow control valves for the temperature controlling medium, such as cooling water. The method also includes determining, either empirically or by calculation, a quantitative spacial distribution of the temperature controlling medium needed to obtain a desired preset, nominal temperature, and comparing the nominal temperature to an actual temperature measured by at least one temperature sensor during the molding cycle. Deviation between the actual temperature and the nominal temperature triggers the plurality of flow control valves for regulating the temperature controlling medium.

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Appellant submits at page 4 of the principal Brief that appealed claims 1, 2 and 4-7 stand or fall together, whereas claims 3 and 10 are argued separately. Since appellant has not separately argued claims 8 and 9, claims 1, 2 and 4-9 stand or fall together.

Appealed claims 1, 2, and 4-9 stand rejected under 35 U.S.C. § 103 as being unpatentable over Evans. Claim 3 stands rejected under 35 U.S.C. § 103 as being unpatentable over Evans in view of Wieder, and claim 10 stands rejected under 35 U.S.C. § 103 as being unpatentable over Evans in view of Wieder and Hall.

We have thoroughly reviewed each of appellant's arguments presented in the principal and Reply Briefs on appeal. However, we are in full agreement with the examiner that the claimed subject matter would have been obvious to one of ordinary skill in the art within the meaning of § 103 in view of the applied prior art. Accordingly, we will sustain the examiner's rejections for essentially those reasons expressed in the Answer, and we add the following primarily for emphasis.

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We consider first the rejection of claims 1, 2 and 4-9 under § 103 over Evans. As pointed out by the examiner, Evans, like appellant, discloses a process of controlling the temperature of an injection mold by using a sensor to control the pulsing of a temperature control medium through the mold.

Appellant contends that the claimed invention uses an actual temperature reading measured at a single point at a certain point in time for each molding cycle to control the coolant pulses, unlike Evans, who teaches using an average temperature to control the cooling medium. However, as explained by the examiner, Evans expressly teaches that a less preferred embodiment of the disclosed invention utilizes only one temperature measurement to control the coolant pulses (page 6, lines 17-23). We do not subscribe to appellant's characterization of Evans's disclosure of the non-preferred embodiment as gratuitous, and it is well settled that non-preferred embodiments of the prior art must be considered in determining obviousness. In re Burckel, 592 F.2d 1175, 1179, 201 USPQ 67, 70 (CCPA 1979); In re Lamberti, 545 F.2d 747, 750, 192 USPQ 278, 280 (CCPA 1976); In re Susi, 440 F.2d 442, 446 n.3, 169 USPQ 423, 426 n.3 (CCPA 1971). We note that

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appellant has presented no objective evidence of record which establishes that the non-preferred use of a single sensor disclosed by Evans produces unexpected results vis-à-vis the preferred use of an average temperature. Furthermore, we do not consider appellant's argument to be germane to the claimed subject matter, inasmuch as claim 1 recites "comparing a preset nominal temperature to an actual temperature measured by at least one temperature sensor" (emphasis added), which encompasses a plurality of temperature sensors that would give rise to a calculation of an average temperature to be compared to the nominal temperature.

Appellant also maintains that it is not necessary for Evans to determine empirically the necessary spacial distribution of the length of the cooling pulses. However, Evans discloses that "the optimum timing of the cooling flow can be selected in accordance with the known temperature curve of the mould" (page 6, lines 6-8). As for appellant's calculation of the quantitative spacial distribution of the temperature controlling medium needed to obtain the desired preset nominal temperature, the evidence of record indicates that it was known in the art to utilize empirical data to

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design the mold and the distribution of cooling channels therein. Wieder discloses that "[p]art geometry and cooling layout determine the length of time of the cooling segment of the injection molding cycle and it is in the manipulation of this segment that the greatest improvement can be achieved" (page 1, column 2, lines 13-16). Also, we agree with the requestor that the May 1984 article written by the present patent owner indicates that it was known in the art that a cooling regime is established before producing the mold, and that the determination of the cooling regime includes the number and location of the cooling conduits, as well as the volume of coolant flow.

Appellant essentially repeats an argument at page 7 of the principal Brief that "Evans does not teach the ordinary person skilled in the art to compare a preset nominal temperature to an actual temperature measured by a single sensor." As explained above, the language of claim 1, lines 7 and 8, "an actual temperature measured by at least one temperature sensor," is not limited to an actual temperature measured by a single sensor, as argued by appellant.

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Concerning separately argued claim 3, we concur with the examiner that the collective teachings of Evans and Wieder evidence the obviousness of employing a flow measuring turbine that is associated with each control valve. Also, it is our view that it would have been obvious for one of ordinary skill in the art to utilize the measurement of Wieder's control valve as feedback for automatically controlling the actual flow rate at the desired value.

We also agree with the examiner that the collective teachings of Evans, Wieder and Hall render separately argued claim 10 obvious to one of ordinary skill in the art. Since Evans and Wieder describe the pulsed delivery of cooling medium (see Evans at page 8, lines 7-9 and Wieder at page 3), it follows logically that the flow measuring turbine of Wieder and Hall would ultimately be used to control the pulses of cooling medium.

As a final point, we note that appellant bases no argument upon objective evidence of nonobviousness, such as unexpected results.



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In conclusion, based on the foregoing and the reasons set forth by the examiner, the examiner's decision rejecting the appealed claims is affirmed.

Further proceedings in this case may be taken in accordance with 35 U.S.C. §§ 141 to 145 and 306, and 37 CFR §§ 1.301 to 1.304. Note also 37 CFR § 1.197(b). If the patent owner fails to continue prosecution, the reexamination proceeding will be terminated, and a certificate under 35 U.S.C. § 307 and 37 CFR § 1.570 will be issued canceling the patent claims, the rejection of which has been affirmed.

AFFIRMED

EDWARD C. KIMLIN	)	
Administrative Patent Judge	)	
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	)	
	)	
CHARLES F. WARREN	)	BOARD OF PATENT
Administrative Patent Judge	)	APPEALS AND
	)	INTERFERENCES
	)	
	)	
THOMAS A. WALTZ	)	
Administrative Patent Judge	)	

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